Fall 2020

The Coastal Monitor Winter/Spring 2020 (Volume 6, No 2)

John Tanacredi Ph.D.

Summer/Fall 2020 *Vol. 6 No. 2*

THE COASTAL MONITOR

NO OCEAN... NO LIFE...NO EARTH

THE OFFICIAL NEWSLETTER OF CERCOM AT MOLLOY COLLEGE / CENTER FOR ENVIRONMENTAL RESEARCH AND COASTAL OCEANS MONITORING

From the Director's Desk...

Welcome Dr. James Lentini, 7th President of Molloy College

It is a distinct pleasure to welcome our new President, Dr. James Lentini, who epitomizes the STEAM connection between Art and Science at Molloy College. Dr. Lentini has been a leader in higher education for more than 30 years and has had stellar academic training in the arts which include his passion for music. From composer, to classical guitarist, to music technology on an international level, receiving countless awards, honors, and praise from the most prestigious entities in the Arts.

His transition to Molloy College was at the peak of the COVID-19 pandemic and his leadership, under these most difficult circumstances for the Molloy College Community, and for him and his family, was inspirational. I look forward to serving under his leadership and am confident his administration will expand our horizons as an academic institution.

We already have a significant connection between the Arts and Science in our STEAM experiences connecting CERCOM's Mission with an appreciation of the interconnections of the arts with science. CERCOM will host new events in 2021 as "Art and Nature" when during Earth week 2021, we will incorporate Science and Art with Leonardo DaVinci: The Worlds Inaugural STEAM Advocate. This virtual event will bring all Molloy College's STEAM initiatives to the forefront for our students. It is a privilege to share the future with Dr. Lentini and I look forward to his creativity and advancement of these initiatives at Molloy College.

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IN THIS ISSUE:

UPCOMING VIRTUAL EVENTS & MORE

CERCOM AT MOLLOY COLLEGE

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CERCOM Mission Statement

Center for Environmental Research and Coastal Oceans Monitoring (CERCOM) CERCOM is a field station supporting the BS in the Earth and Environmental Studies and all the sciences in the BCES department through scientific research, hands-on fieldwork in the sciences and a comprehensive environmental monitoring facility of Molloy College and is located on the Great South Bay at the historic Blue Points Oyster Hatchery in West Sayville. CERCOM is committed to advancing knowledge and developing solutions to environmental problems in coastal ecosystems through a network of group-cooperative monitoring activities, Horseshoe Crab captive breeding programs, and research. In partnership with monitoring networks at the federal, state, local, and international levels, CERCOM provides the data necessary to implement ecosystem-based management recommendations which assure the long-term health of estuarine environments on Long Island while focusing attention on the ecosystem health of estuarine environments worldwide and an active internship opportunity for science students.

Questions and comments can be sent to CERCOM@molloy.edu

Summer Internships - A Modified Response to Covid-19

Due to the Covid-19 Pandemic Interns at CERCOM/ Molloy College worked socially distant wearing masks and gloves as required, while preforming general tasks which included daily Meteorological data collection, HSC beach inventory, Phytoplankton Inventory sampling, Water Quality monitoring, and Aquaculture maintenance.

Student	Major	Institution
Emma Hahn	Environmental Law	Binghamton University (SUNY)
Bailey Rosen (Not Pictured)	Earth & Environmental Studies – Like Conservation Scholarship	Molloy College
Richard Kevan (Not Pictured)	Education	Molloy College
Mason Hermges	Education- NOYCE Scholar	Molloy College
Kathleen Doherty	Pre-Professional Medicine	Molloy College
Zuberi Symister	Pre-Professional Medicine	Molloy College
Caroline Kane (Not pictured)	Earth & Environmental Studies- ASPIRE Scholarship	Molloy College

A Big Thank You to All of the Interns Who Assisted at CERCOM During the 2020 Pandemic.

Binghamton **SUNY Environmental Law** student **Emma Hahn** enjoys her intern experience at CERCOM over the summer of COVID-19. Emma is from Long Island and is seen here at a local Long Island Estuary helping with Horseshoe Crab Monitoring.

Molloy College **Pre-Professional Medical student**, **Zuberi Symister**, is shown here interning at CERCOM over the summer of Covid-19 (2020) taking water measurements at the Meteorological Station, Precipitation Gauge. CERCOM monitors this station for NOAA (National Oceanic and Atmosphere Administration) and NWS (National Weather Service). Horseshoe Crabs are being fed with tongs by **Zuberi** at CERCOM Field Station, in West Sayville, Long Island New York.

Kathleen Doherty Intern, Studying **Pre-Professional Medicine** at Molloy College was another student that helped during the Covid-19 pandemic taking care of our animals.

All interns participate in the products that are produced at CERCOM:

- CERCOM Great South Bay Water Quality Report
- Long Island Horseshoe Crab Habitat Inventory
- Daily NWS Meteorological Data
- NOAA Phytoplankton Inventory

https://www.molloy.edu/academics/undergraduate-programs/biology/cercom/reports

NSF Scholarships

Summer 2020 NOYCE Scholars

Karena Kellman

Lenee Mason

Mason Hermges

This summer, Noyce Ambassadors, Karena Kellman, Lenee Mason, and Mason Hermges, socially distanced at CERCOM and worked with two specially selected high school teachers with expertise in earth science and mathematics. The Master Teachers, from the Freeport school district, helped the Noyce Ambassadors delve deeper into research and pedagogy as well as prepare for careers in high needs schools. NOYCE Ambassadors were introduced to a full K-12 curriculum completely based on horseshoe crab biology and evolution. These future teachers all used CERCOM's hands-on field experiences as foundational content in STEM sciences to expand their pedagogy foundation. Bravo to our future science teachers!

COVID-19 Link

Molloy College Professor John Tanacredi Tells CBS News Horseshoe Crabs Hold Key to Coronavirus Vaccine

The safety of any coronavirus vaccine depends on an ancient sea creature, Horseshoe crabs. Professor John Tanacredi, Director of Molloy College's Center for Environmental Research and Coastal Oceans Monitoring (CERCOM) discussed these incredible arthropods and the LAL (Limulus Amebocyte Lysate) derived from their copper-based blue blood.

Dr. John T. Tanacredi, Director of CERCOM & Professor at Molloy College

See full video here:

https://www.molloy.edu/about-molloy-college/news-and-events/news-archive/molloy-college-professor-john-tanacredi-tells-cbs-news-horseshoe-crabs-hold-key-to-coronavirus-vaccine

Saturday Science for Students at the Explorer's Club Goes Virtual

Fall 2020 Saturday Science for Students went Virtual which meant it was an opportunity to engage more students and their families on Careers in the Sciences. This coming Spring 2021, we will continue to be virtual. Registration is open via email to **CERCOM@molloy.edu** with date you would like to attend. A link will be sent to your email, prior to each event.

Upcoming dates:

Mar. 13, 2021 - Speaker TBA

April 10, 2021- Speaker TBA

May 8, 2021 - Chester B. Zarnoch, Ph.D., Dept. of Natural Sciences, Baruch College, CUNY

If you missed any Saturday Science for Student lectures in the past, here are the links to some notable scientists who talk about their careers"

Saturday Science for Students with Environmental Scientist Dr. John T. Tanacredi
https://explorers.org/events/detail/saturday-science-for-students

Saturday Science for Students with Environmental Scientist Dr. Mark Ringenary
https://explorers.org/events/detail/saturday-science-for-students-with-environmental-scientist-dr.-mark-ringenary

Saturday Science for Students with Aquatic Scientist Dr. Robert Nuzzi
https://explorers.org/events/detail/saturday-science-for-students-with-aquatic-scientist-dr.-robert-nuzzi

Saturday Science for Students with Population Ecologist Dr. Artie Kopelman
https://explorers.org/events/detail/saturday-science-for-students-with-population-ecologist-dr.-artie-kopelman

More interesting Scientific Exploratory information can be found at: https://www.explorers.org/

RESEARCH

CERCOM Water Quality Report – Results in Spite of Covid – 19, Summer 2020:

The Molloy College CERCOM Field Station completed its Annual Water Quality Report of Great South Bay for 2020; the Pandemic Year. Once a week between April and October, our staff and students board our boat out of the West Sayville Boat Basin, for a sampling run that has already helped to improve the bacteriological water quality in Great South Bay. CERCOM's data was used 10 years ago to help develop regulations in NYS against discharges from boat wastewaters; "no discharge zone" for Great South Bay. Today recreational vessels are not allowed to discharge untreated waste into Great South Bay, and in this pandemic year, water quality in Great South Bay can only be graded as "A+". The CERCOM Molloy College data monitoring program (celebrating 20 years), continues to collect water samples from key locations over a distance of about 45 miles within the confines of the Great South Bay. This has been a consistent and persistent data monitoring activity even during Superstorm Sandy (2012), as well as the present COVID-19 pandemic (2020). Water Quality data collection is coupled with a NWS Co-Op site meteorological station providing daily environmental data to NOAA's National Weather Service. CERCOM research provides the information needed for reliable annual and multi-year trend analyses. In addition, a USGS Tide Gauge maintained by CERCOM, as well as the weekly sampling of marine phytoplankton found in GSB, it all rounds out the interdisciplinary monitoring program which is the key mission of CERCOM.

> "Once a week ... our staff and students board our boat...for a sampling run that has already helped to improve the bacteriological water quality in Great South Bay."

Results of the last four years of water quality trends for Great South Bay, provide the proverbial "Good news; Bad news!" results. First the good news; the dissolved oxygen values (both surface and bottom values) have been robust overall and outstandingly consistent in spite of the chronic unsubstantiated reports of "excessive nitrogen loading from 360,000 residential septic systems", which have been put to the test of overload during this pandemic with no resultant ecological concerns. Coastal ecologists have always expressed concerns of low dissolved oxygen levels at the bottom sediments of estuaries. Hypoxia (less than an average 4 mg/L DO) is exasperated by oxygen demanding conditions and decomposing organic contributions to the benthos. Below a few inches in benthic sediments of estuaries, denitrification processes occur, which are mostly anaerobic, further reducing DO levels should these sediments be disturbed. This disturbance of sediments can happen when strong tide currents move through an inlet, or after large scale meteorological phenomenon such as a tropical storm such as Isais(2019) or a nor'easter or by dredging activities. All indications from our monitoring of Great South Bay, reveal DO values exhibited by a healthy oxygen saturation condition **(Figure 1)** which in the last six years has supported the most abundant level of finfish populations in Long Island coastal waters that has been observed in over two decades. (ie. Menhadden, Stripped Bass, Bluefish, and Winter Flounder). The herbivorous finfish such as Menhaden (bunker) have been incredibly important in contributing to dramatic increases in migrating whales like Humpbacks. In another LI waterway, Jamaica Bay, review of the Annual Water Quality Reports of the National Park Service(2012-2020), reveal a similar positive DO trend mostly attributable to the pollution abutment by NYC WWFT. Benthic invertebrates have all benefitted from these oxygen rich waters with significant concentrations of native hard shell clams in abundance in areas such as Head of the Bay near JFK Airport, and in the interior marshes of the Jamaica Bay Wildlife Refuge. Research published on Jamaica Bas productivity (Tanacredi, et.al, 2016) had reported the long-term history of bivalve abundance per square meter in Jamaica Bay, rivaling other much larger estuarine coastal ecosystems in biological productivity and species diversity indexes such as the Chesapeake Bay. Prevention of dredging disrupting benthic sediments and the dramatic improvement in water quality due to the improved compliance of SPDES permitted sewage treatment plants (320 million gallons per day from four STP's in Jamaica Bay) have collectively contributed to the improve ecological health of Jamaica Bay. In addition Newsday reported on (see Newsday) Long Island sound waters making marked improvements in water quality over the last two decades. All quite positive good news for Long Islands coastal habitat.

Now for the "Bad News". Results of the same ongoing multi-year CERCOM water quality monitoring program of changing pH values in the Great South Bay, reveal that the average pH from before Super storm Sandy (2012), has continued to decline from 8.3 to as low as 6.0 at 9 sample locations for average over the last 6 years, pH of 6.89 across the Bay. **(Figure 2)** The global oceans' decline in recorded average pH over the last 200 years has been reported in the literature to be only from 8.2 to 8.1. However, even this 0.1 decline in average pH on a global scale, is significant. I was initially surprised that the pH trend data for the Great South Bay, showed average pH's continuing to drop to 7.8 (2017) in spite of the Superstorm Sandy's new inlet breach through Fire Island being left open. pH changes in water quality results from various dynamic biological and geological phenomena found in estuaries, such as tidal flushing, high phytoplankton productivity (a good thing ecologically), respiration, the abundance of calcium carbonate in sediments, and, in some cases, bioturbation. In a related concern that impacts estuarine water pH, the last three summer seasons (2017 -2019) exhibited a dramatic up-tick in the number of summer daily advisory ground level ozone (O_3) concentrations reported by NYSDEC. Nitrous oxide emissions from automobiles is a major contributor of this photochemical oxidant being formed, and is ultimately washed out of atmosphere of contributing this form of nitrogen to surface waters of the estuary. This is potentially a significant contributing factor in the lower pH trends. It is commonly thought by some in the environmental community, that leaving the breach "open" would affect greater cleansing of the Great South Bay. The breach appears to have not contributed in any observable way to the recovery of pH and /or DO, two critically important water quality parameters of estuaries and the nearshore ocean. The implications of these trends when compared to our most recent summer 2020 water quality monitoring efforts considering the Covid-19 pandemics unintended consequences to Great South Bay, we have observed a dramatic curtailment of air and land transportation resulting in a practical illumination of nitrous oxide emissions (March through October) contributing of nitrogen from atmosphere washing (precipitation events), and a dramatic increase in water clarity and DO values. Long Island in general had a banner year of no "harmful algal bloom" incidents; no fishkills or shellfish mass mortality and an amazing uptick of marine mammals like Humpback Whales along our near ocean coastlines.

Molloy College's Earth and Environmental Science students will continue to assist in monitoring these important water quality and meteorological parameters, for their continuously gathered data is required to help in evaluating Long Island's estuarine health and application of effective environmental management at CERCOM, Molloy College's Field Station. The Great South Bay estuarine natural resources are robust and productive, in spite of ourselves.

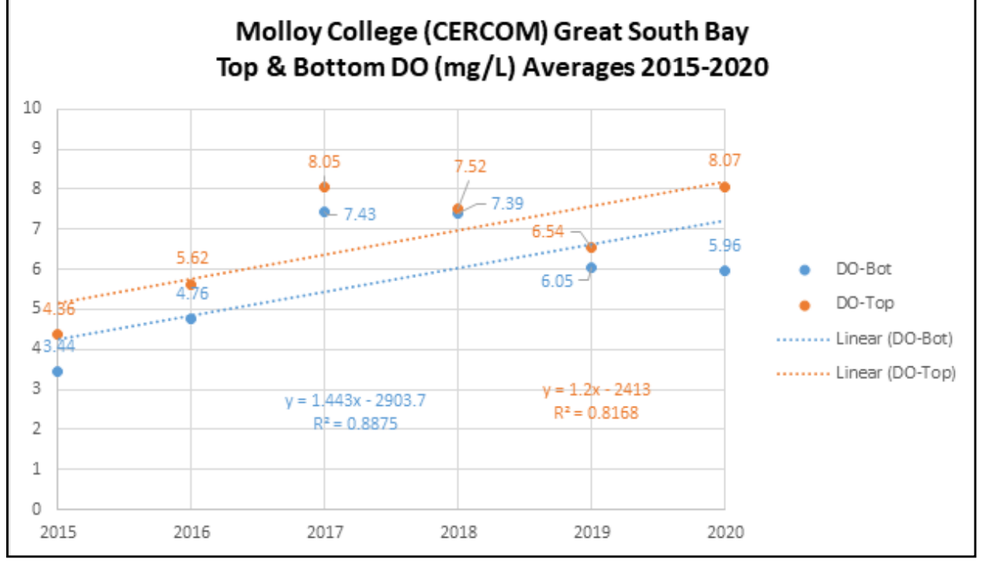
Ask to be placed on our information and Newsletter mailing lists, or schedule a visit to the Nation's only captive breeding laboratory for Horseshoe Crabs, at CERCOM@molloy.edu.

By John T. Tanacredi, Ph.D.

Ref: Tanacredi, J.T., M.P. Schreibmann, K. McDonald (2016) "Questioning Ecosystem Assessment and Restoration Practices in a Major Urban Estuary: Perpetuating Myths of Degradation in Spite of the Facts" Journal of Environmental Science and Engineering, vol. 5, Issue 2

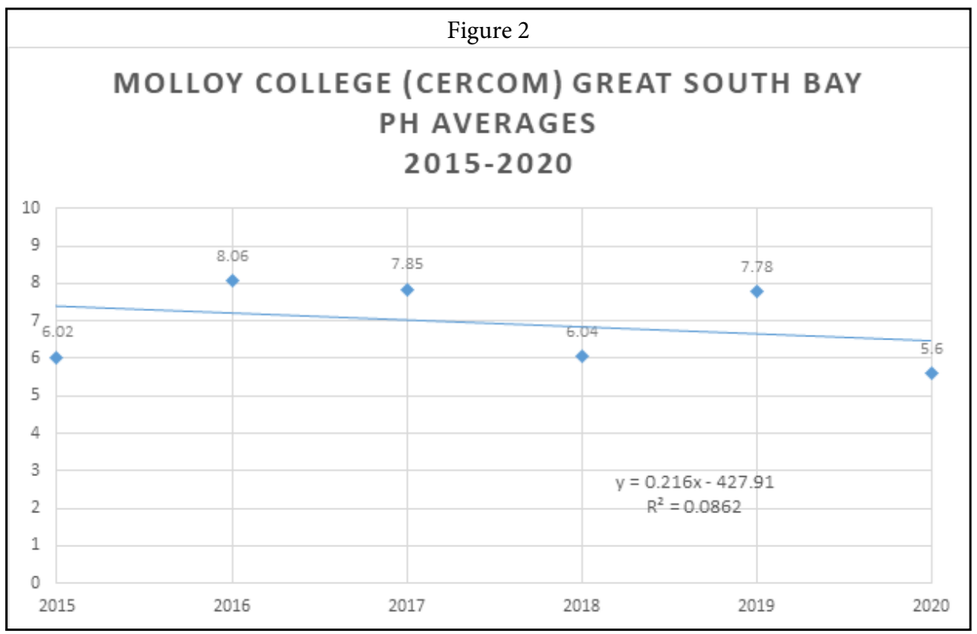
6 year trend of the Great South Bay top and bottom Dissolved Oxygen values:

Figure 1



6 year trend of the Great South Bay pH values:

Figure 2



*All raw data is available upon request, held in reserve at CERCOM.

"My Corner of the Circle"

Editorial Note

Back on June 20, 2020, a NY Times article "Climate change Is Transforming the Time-honored Home Loan", had a photo of homes in Nags Head N.C. as Hurricane Florence approached the shore in 2018. I responded to this article after the hurricane season was over primarily because this articles' main front-page picture is exquisitely accurate in identifying immediately what the actual causative factor is in transforming the world's coastal communities, and it is not changing climate. It is sprawl development with the majority of homes built on pilings right in the near shore intertidal zone! This is nothing new. The inability to get insurance is not the principle factor in these natural disasters; it is that insurance is even made available for covering catastrophic natural events like forest fires in chaparral ecological environment, or for all hurricane hazardous zones along the coast. "In 30 years from now, if global warming emissions follow their current trajectory, almost half a million existing homes will be on lands that flood at least once a year, according to data from Climate Central, a research organization"; noted in the New York Times article. Here is the problem hiding in plain sight; existing homes built in harm's way over the previous 70 year expanse of time have tripled in number. Two-thirds of our global population live within one hour's drive of the coastline. Interest only mortgage loans, flood insurance rates increasing, or coastal homes uninsurable, and risk analyses identifying the most vulnerable coastal locations, all mean little if you are living along the coast. No development leads to no sprawl, which leads to no insurance needs, which leads to no FEMA damages restoration. Pollyannaish goal? Maybe, but coastal development continues to run rampant and even after the hurricane's Katrina, Sandy and Florence, there remains a self-fulfilling prophecy. The cost of living near the shore only goes up! Human behaviors will catastrophize, rebuild and then irrationally conclude that something is far worse than it is. Unfortunately, coastal communities have met their misconceptions with a hope that another cataclysmic event will not happen to them. So, who's Pollyannaish?

John T. Tanacredi, PhD
Professor of Earth & Environmental Sciences
Director of CERCOM
Molloy College

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The information, views and opinions expressed herein are those of the author and do not necessarily reflect the views or opinions of Molloy College. Molloy College does not make any representations or warranties with respect to the accuracy or reliability of the information contained herein.

Help Support the Molloy College BS Earth and Environmental Sciences Student Scholarship Degree Program

Dear Reader: The BS degree in Earth and Environmental Sciences at Molloy College is directly connected to our field station to experience a wide variety of field studies including a first-hand experience of the long-term CERCOM Environmental Monitoring Program!

Thank you for efforts to share some of your life and career experiences of exploration and academic enrichment with our students. You have trust in us as Faculty, Academicians and Research Scientists to reveal to you the career path our students choose. I hope that it has made your life richer and more fulfilling, when we observe or experience the diversity and good health of our natural resources.

In this truly unconventional time, we now come to you, to ask for your help. The cause is for excellent education, precise science, and interdisciplinary experiences for our Earth and Environmental Science students ultimately navigating what can be a difficult journey to enriching careers and global experiences. CERCOM at Molloy College and its science community need your assistance. Will you consider becoming a champion for the Horseshoe Crab by making a gift to Molloy College's Earth and Environmental Science Scholarships?

Your response to this appeal can make a dramatic difference. Your donation will build scholarships for students in the Earth and Environmental Sciences that will be game changers.

We cannot prepare our future scientists and natural resource managers without your help. So please consider CERCOM at Molloy College in you decision about charitable giving.

Please know how honored we are when you choose to make a gift to CERCOM at Molloy College Earth & Environmental Science Scholarship. Tear off the bottom donation form and check the level of your contribution.

Any amount is greatly appreciated. Thank you.

John T. Tanacredi, Ph.D.

Director CERCOM
Professor of Earth and Environmental Sciences
Molloy College

To make a Donation to Earth & Environmental Studies Student Scholarships

Name: _____

Address: _____

City:_____ State:_____ Zip_____

Cell Phone: _____ Home Phone: _____

Email Address: _____

Enclosed is my check payable to Molloy College of $_____

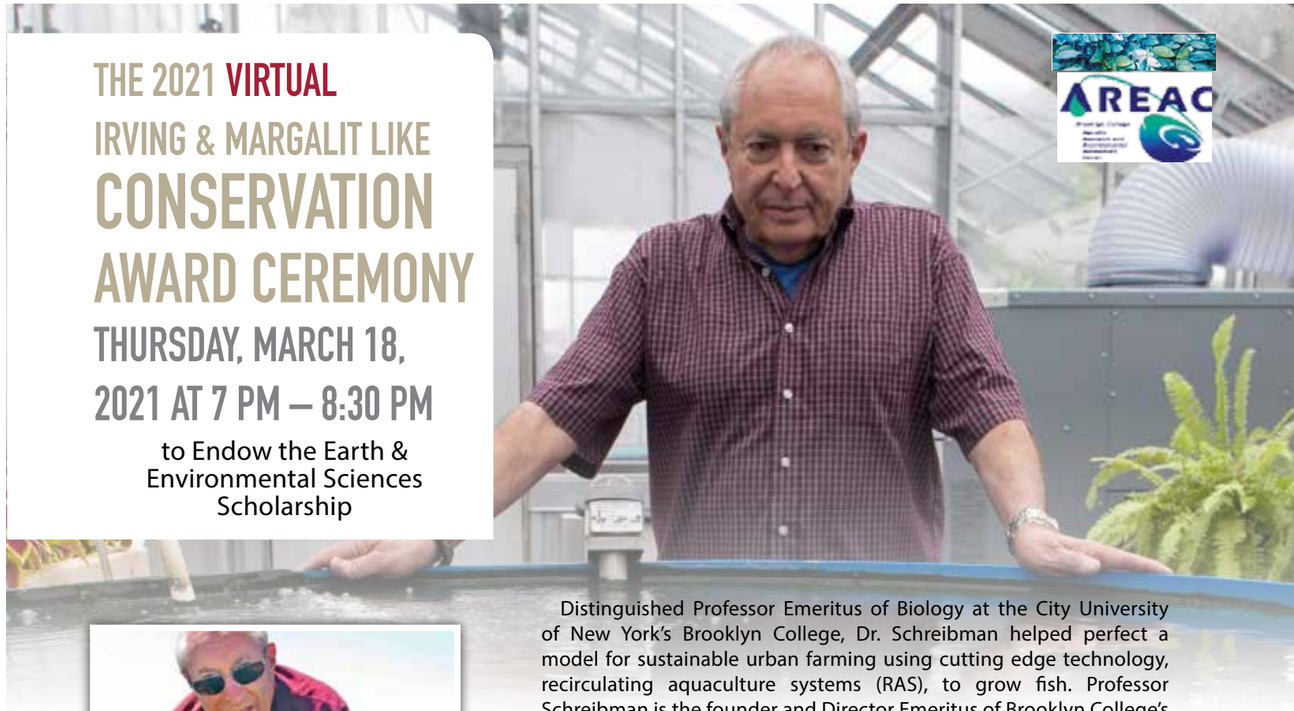
Charge my Visa, Mastercard, Discover or American Express in the amount of $_____

Card no.: _____ Expiration _____Security Code_____

Signature: _____

Mail donations to:
Molloy College
Attn: Cynthia Metzger
1000 Hempstead Ave.
Rockville Centre, NY 11571-5002

or Donate online at: http://connect.molloy.edu/eesscholarship



THE 2021 VIRTUAL IRVING & MARGALIT LIKE CONSERVATION AWARD CEREMONY

THURSDAY, MARCH 18, 2021 AT 7 PM – 8:30 PM

to Endow the Earth & Environmental Sciences Scholarship

Founding Director

Distinguished Professor Emeritus of Biology at the City University of New York's Brooklyn College, Dr. Schreibman helped perfect a model for sustainable urban farming using cutting edge technology, recirculating aquaculture systems (RAS), to grow fish. Professor Schreibman is the founder and Director Emeritus of Brooklyn College's Aquatic Research and Environmental Assessment Center (AREAC), a research facility devoted to the study of aquatic organisms — how they grow, adapt, reproduce, and live in all temperatures and environments. He and his multidisciplinary team of researchers sought to answer questions about medicine, nutrition, pollution, aquaculture, fisheries, and marine ecology. AREAC's projects include bivalve and fish aquaculture, breeding horseshoe crabs, educational outreach, and product commercialization. Dr. Schreibman has devoted many years to developing urban aquaponics — growing both fish and plants together in a symbiotic water re-use system. Over the past 35 plus years, his recirculating farming techniques have been used for assorted projects — even in outer space. In 1998, on the NASA space shuttle Endeavor, he worked with Dr. Volker Bluem of Germany to develop a small system to test whether growing fresh food in space could be an option for lengthy trips to other planets. Dr. Schreibman is a Founding Board Member (Emeritus) for the Coalition and presently an inaugural member of the CERCOM Advisory Council at Molloy College.

Registration opens March 1, 2021 at
http://connect.molloy.edu/conservationaward2021
Donations can be made online at:
http://connect.molloy.edu/eesscholarship

For more information contact: Regina Gorney at rgorney@molloy.edu or call 516.323.3594

Images Courtesy Of: http://narrative.ly/something-fishy-this-way-comes

LIVE TO LEARN. LIVE TO DISCOVER. LIVE YOUR STORY.

JOIN US FOR AN EARTH DAY 2021

FREE VIRTUAL EVENT

FOCUSING ON:

S SCIENCE **T** TECHNOLOGY **E** ENGINEERING **A** ART **M** MATHEMATICS

WITH KEYNOTE SPEAKER

ANN C. PIZZORUSSO

AUTHOR, GEOLOGIST AND ITALIAN RENAISSANCE SCHOLAR

"I LOOK AT HOW THE LAND AFFECTS THE DEVELOPMENT OF CIVILIZATION; THROUGH THE EYES OF LEONARDO DA VINCI, THE FIRST STEAM PROTAGONIST."

ANN C. PIZZORUSSO

APRIL 22, 2021 NOON TO 1:30 PM (EST)

FREE VIRTUAL EVENT

VIRTUAL DETAILS WILL BE SENT PRIOR TO EARTH DAY TO ALL REGISTRANTS

FOR MORE INFORMATION, CONTACT REGINA GORNEY
516.323.3594 OR RGORNEY@MOLLOY.EDU

Center for Environmental Research and Coastal Oceans Monitoring
CERCOM AT MOLLOY COLLEGE

THIS IS A FREE EVENT

REGISTER HERE: CONNECT.MOLLOY.EDU/STEAM2021